IN THE CLAIMS:
Kindly replace the claims of record with the following full set of claims:

1. (Currently amended) A transmission system for transmitting a multilevel signal (~~x_k~~) from a transmitter (~~10~~) to a receiver (~~20~~), the transmitter (~~10~~) comprising a mapper (~~16~~) for mapping an input signal (~~i_k~~) according to a signal constellation onto the multilevel signal (~~x_k~~), the receiver (~~20~~) comprising a demapper (~~22~~) for demapping the received multilevel signal (~~y_k~~) according to the signal constellation, wherein the signal constellation comprises 2^m signal points with corresponding labels of m bits in length, and satisfies the criteria:

~~and wherein~~ $D_a > D_f$, with D_a being the minimum of the Euclidean distances between all pairs of signal points whose corresponding labels differ in a single position, and with D_f being the minimum of the Euclidean distances between all pairs of signal points, and

the average Hamming distance (H_1) between all pairs of labels corresponding to neighboring signal points has a substantially minimum value.

2. (Previously presented) The transmission system according to claim 1, wherein D_a has a maximum value.

3. (Cancelled)

4. (Currently amended) The transmission system according to claim 1, wherein the signal constellation is a 16-QAM signal constellation ~~as depicted in any one of the FIGS. 8A to 8G or an equivalent signal constellation thereof~~.

5. (Currently amended) The transmission system according to claim 1, wherein the signal constellation is a 64-QAM signal constellation ~~as depicted in any one of the FIGS. 9A to 9C and 10 or an equivalent signal constellation thereof~~.

6. (Currently amended) The transmission system according to claim 1, wherein the signal constellation is a 256-QAM signal constellation ~~as depicted in any one of the FIGS. 11A and 11B or an equivalent signal constellation thereof~~.

7. (Currently amended) The transmission system according to claim 1, wherein the signal constellation is a 8-PSK signal constellation ~~as depicted in any one of the FIGS. 12A to 12C or an equivalent signal constellation thereof~~.

8. (Currently amended) A transmitter ~~(10)~~ for transmitting a multilevel signal ~~(x_k)~~, the transmitter ~~(10)~~ comprising a mapper ~~(16)~~ for mapping an input signal ~~(i_k)~~ according to a signal constellation onto the multilevel signal ~~(x_k)~~, wherein the signal constellation comprises 2^m signal points with corresponding labels of m bits in length, and satisfies the criteria: ~~and wherein~~

$D_a > D_f$, with D_a being the minimum of the Euclidean distances between all pairs of signal points whose corresponding labels differ in a single position, and with D_f being the minimum of the Euclidean distances between all pairs of signal points, and

the average Hamming distance (H_1) between all pairs of labels corresponding to neighboring signal points has a substantially minimum value.

9. (Currently amended) The transmitter ~~(10)~~ according to claim 8, wherein D_a has a maximum value.

10. (Cancelled)

11. (Currently amended) A receiver ~~(20)~~ for receiving a multilevel signal ~~(y_k)~~, the receiver ~~(20)~~ comprising a demapper ~~(22)~~ for demapping the multilevel signal ~~(y_k)~~ according to a signal constellation, wherein the signal constellation comprises 2^m signal points with corresponding labels of m bits in length, and satisfies the criteria: ~~and wherein~~

$D_a > D_f$, with D_a being the minimum of the Euclidean distances between all pairs of signal points whose corresponding labels differ in a single position, and with D_f being the minimum of the Euclidean distances between all pairs of signal points, and

the average Hamming distance (H_1) between all pairs of labels corresponding to neighboring signal points has a substantially minimum value.

12. (Currently amended) The receiver ~~(20)~~ according to claim 11, wherein D_a has a maximum value.

13. (Cancelled).

14. (Currently amended) A mapper ~~(16)~~ for mapping an input signal ~~(i_k)~~ according to a signal constellation onto a multilevel signal ~~(x_k)~~, wherein the signal constellation comprises 2^m signal points with corresponding labels of m bits in length, and satisfies the criteria:

~~and wherein~~ $D_a > D_f$, with D_a being the minimum of the Euclidean distances between all pairs of signal points whose corresponding labels differ in a single position, and with D_f being the minimum of the Euclidean distances between all pairs of signal points, and

the average Hamming distance (H_1) between all pairs of labels corresponding to neighboring signal points has a substantially minimum value.

15. (Currently amended) The mapper ~~(16)~~ according to claim 14, wherein D_a has a maximum value.

16. (Cancelled).

17. (Currently amended) A demapper ~~(22)~~ for demapping a multilevel signal ~~(y_k)~~ according to a signal constellation, wherein the signal constellation comprises 2^m signal points with corresponding labels of m bits in length, ~~and wherein~~ and satisfies the criteria:

$D_a > D_f$, with D_a being the minimum of the Euclidean distances between all pairs of signal points whose corresponding labels differ in a single position, and with D_f being

the minimum of the Euclidean distances between all pairs of signal points, and

the average Hamming distance (H_1) between all pairs of labels corresponding to neighboring signal points has a substantially minimum value.

18. (Currently amended) The demapper ~~(22)~~ according to claim 17, wherein D_a has a maximum value.

19. (Cancelled).

20. (Currently Amended) A method of transmitting a multilevel signal ~~(x_k)~~ from a transmitter ~~(10)~~ to a receiver ~~(20)~~, the method comprising the steps of: mapping an input signal ~~(i_k)~~ according to a signal constellation onto the multilevel signal ~~(x_k)~~, transmitting the multilevel signal ~~(x_k)~~, receiving the multilevel signal ~~(y_k)~~ and demapping the multilevel signal ~~(y_k)~~ according to the signal constellation, wherein the signal constellation comprises 2^m signal points with corresponding labels of m bits in length, ~~and wherein~~ and satisfies the criteria:

$D_a > D_f$, with D_a being the minimum of the Euclidean distances between all pairs of signal points whose corresponding labels differ in a single position, and with D_f being the minimum of the Euclidean distances between all pairs of signal points, and

the average Hamming distance (H_1) between all pairs of labels corresponding to neighboring signal points has a substantially minimum value.

21. (Previously presented) The method according to claim 20, wherein D_a has a maximum value.

22. (Cancelled)

23. (Currently amended) A multilevel signal, the multilevel signal being the result of a mapping of an input signal ~~(i_k)~~ according to a signal constellation, wherein the signal constellation comprises 2^m signal points with corresponding labels of m bits in length, ~~and wherein~~ and satisfies the criteria:

$D_a > D_f$, with D_a being the minimum of the Euclidean distances between all pairs of signal points whose corresponding labels differ in a single position, and with D_f being the minimum of the Euclidean distances between all pairs of signal points, and

the average Hamming distance (H_l) between all pairs of labels corresponding to neighboring signal points has a substantially minimum value.

24. (Previously presented) The multilevel signal according to claim 23, wherein D_a has a maximum value.

25. (Cancelled).

26. (Currently amended) The multilevel signal according to claim 23, wherein the signal constellation is a 16-QAM signal constellation ~~as depicted in any one of the FIGS. 8A to 8G or an equivalent signal constellation thereof~~.

27. (Currently amended) The multilevel signal according to claim 23, wherein the signal constellation is a 64-QAM signal constellation ~~as depicted in any one of the FIGS. 9A to 9C and 10 or an equivalent signal constellation thereof~~.

28. (Currently amended) The multilevel signal according to claim 23, wherein the signal constellation is a 256-QAM signal constellation ~~as depicted in any one of the FIGS. 11A and 11B or an equivalent signal constellation thereof~~.

29. (Currently amended) The multilevel signal according to claim 23, wherein the signal constellation is a 8-PSK signal constellation ~~as depicted in any one of the FIGS. 12A to 12C or an equivalent signal constellation thereof~~.